



August 9, 2014

Ms. Sondra Ruckwardt  
U.S. Army Corps of Engineer District, Portland  
Attn: CENWP-PM-E/Double-crested Cormorant draft EIS  
P.O. Box 2946  
Portland, Oregon 97208-2946

Dear Ms. Ruckwardt:

This letter is in response to the draft environmental impact statement (draft EIS) from the Army Corps of Engineers ("Corps") on the *Double-crested Cormorant Management Plan to Reduce Predation of Juvenile Salmonids in the Columbia River Estuary*.

Audubon Society of Portland ("Audubon") strongly opposes the preferred alternative (Alternative C) and instead urges the USACOE to adopt Alternative A, the "no action alternative." We believe that the Corps has failed to take the requisite "hard look" at available options as is required in an environmental impact statement (DEIS) and that the selection of Alternative C would be arbitrary and capricious and not in accordance with the facts. We further believe that the implementation of Alternative C would violate other wildlife laws including the Migratory Bird Treaty Act and the Endangered Species Act and could threaten the continued existence of Double-crested Cormorants in the Western United States.

**Overview:**

First we would like to begin with some "myth busting." The narrative put forward by the Corps in the popular media and some political circles would have it that Double-crested Cormorant (hereafter abbreviated as "cormorant(s)") populations have "exploded" and that the birds associated with the colony at East Sand Island are consuming federally listed salmonid smolts at such a high rate that it is thwarting recovery efforts and jeopardizing the continued existence of Columbia River salmonid stocks. Further, Corps rhetoric suggests that the only way to address this issue is to kill approximated 16,000 cormorants because other management strategies would result in displacement to other locations that could be even more problematic.

Audubon Society of Portland  
5151 NW Cornell Road  
Portland, OR 97210  
(503) 292-6855  
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The facts tell a very different story: The preferred alternative recommended by the US Army Corps of Engineers calls for extensive lethal control of a native wildlife species that has coexisted with salmon and steelhead since time immemorial. As many as 16,000 birds, 25% of the breeding population of cormorants in the Western United States, would be slaughtered using shotguns to kill birds over water and rifles to kill birds at close range on their active nest sites. Due to persecution and environmental contaminants, populations of cormorants in the Western United States are already an order of magnitude smaller than they were a century ago<sup>1</sup> and have been declining throughout much of their range in the Pacific Northwest in recent decades (Adkins and Roby 2010, Pacific Flyway Council 2012). The science describing cormorant impacts on listed salmon and steelhead, the efficacy of other alternative strategies for reducing predation on listed salmonids, and the alleged benefits of the preferred alternative for salmonid recovery is incomplete, inconclusive and for the most part, not peer reviewed. Some critical data for assessing the modelling is not even available for public review. Most importantly, federal courts have repeatedly rejected strategies developed by the Corps and other federal agencies to address one of the primary causes of salmon declines in the Columbia River Basin – the existence and operation of federal dams. Further, the Corps and other federal agencies have been slow to take steps to minimize or eliminate myriad other adverse impacts on salmon habitat undertaken or approved by these agencies. In this light, the proposal to kill cormorants on East Sand Island represents the worst kind of scapegoating---a plan that demonizes and harms a native species while diverting attention from the difficult but necessary steps needed to recover listed salmonid species in the Columbia River.

#### **Background:**

East Sand Island is a remarkable place. Historically no more than a shifting sandbar, the US Army Corps of Engineers stabilized the island and used it to deposit dredge spoils during from the 1940s until the 1980s. Today the island encompasses nearly 60-acres and is home to a remarkable assortment of birds, including the largest breeding colonies of Caspian Terns (10,700 breeding pairs at its peak in 2008) and cormorants (approximately 15,000 breeding pairs in 2013) in the world, and the largest post-breeding roost site for Brown Pelicans (>10,000 in individuals) on the West Coast. Federally listed Streaked Horned Larks have also been observed on the island, although no nesting has been documented. The island has been recognized an officially designated Globally Important Bird Area (IBA) by both the Audubon Society and the American Bird Conservancy.

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<sup>1</sup> Historic numbers of DCCO in the western population were at least magnitude higher than they are today (current population is estimated at around 31,200; Adkins in press). As a case in point, in the early 20<sup>th</sup> Century just one colony in Baja numbered >300,000 birds. This former colony alone represents more than nine times the current western population of DCCOs (Wires and Cuthbert 2006).

2 to 4 yr

In the Preferred Alternative C, USACOE proposes to shoot 15,995 cormorants over a three year timeframe in order to reduce the East Sand Island cormorant colony population from a three year average of 13,400 pairs to 5,380-5,939 pairs. Cormorants would be killed using shotguns over water and, to the degree that lethal quotas could not be attained via this method, also shot on their nests after the onset of nesting. Nestlings and eggs from those active nests would then be destroyed.<sup>2</sup> Phase 2 of Alternative C would also include oiling of eggs and significant reduction of the available cormorant habitat on East Sand Island. Additionally, significant cormorant hazing would occur on other islands in the Columbia Estuary to ensure that cormorants were not able to establish colonies in other proximal locations.

Audubon Society of Portland remains deeply concerned about the status of Columbia River salmonid populations listed under the Federal Endangered Species Act ("ESA"). However, we do not believe that USACOE has made a compelling case that large-scale lethal control of cormorants at East Sand Island is a necessary or effective strategy for salmonid recovery. Nor do we believe the USACOE and other partner agencies have done enough to address the primary causes of salmonid declines: management of the Federal Columbia River Power System (FCRPS), habitat loss and fragmentation, and management of hatcheries. Beyond the ethical and economic implications of the proposed alternative, this recommendation has a high potential to do little or nothing to help recover salmonid populations while seriously harming cormorants.

**Our specific concerns include the following:**

1. The DEIS fails to adequately assess the cumulative impacts on cormorant populations in the Western United States;
2. The Corps has failed to identify alternative sites for nesting colonies in the Pacific Northwest or to set minimum viable population levels for cormorants;
3. The science describing cormorant predation on listed salmonid species supporting the preferred alternative is weak and lacks peer review, and the DEIS fails to make a compelling case that lethal control of cormorants will result in significant benefits for listed salmonid species;
4. The DEIS fails to adequately address impacts on non-target species, including federally listed (threatened) Streaked Horned Larks;
5. The Corps fails to make a compelling case as to why it cannot pursue non-lethal alternatives;
6. The preferred alternative potentially threatens the continued existence of Double-crested Cormorants in the Western United States and would violate the provisions of the Migratory Bird Treaty Act;
7. The DEIS fails to consider an adequate range of alternatives to improve survival of juvenile salmonids listed under the ESA.

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<sup>2</sup> Personal phone communication with Kevin Christianson, USDA Wildlife Services

8. It is time for a full review of Corps' management strategies for piscivorous birds along the Columbia River.

#### Specific Concerns with the Environmental Impact Statement:

1. The DEIS fails to adequately assess the cumulative impacts of the preferred alternative on Double-crested Cormorant populations in the Western United States and fails to set scientifically credible minimum populations levels:

The Proposed 2- 4-year lethal strategy described in Alternative C is expected to result in a 25%-26% reduction in the population of cormorants in the Western United States (DEIS at 4-13). The Corps seeks to return western cormorant populations to ca. 1990 levels and argues that western populations "could remain static thereafter since most of the growth since 1990 occurred on East Sand Island" (*id.*) The decision to set population targets at 1990 levels is completely arbitrary especially since, as we have already noted, the western population of cormorants is already at least an order of magnitude smaller than it was historically. The date seems to have been chosen exclusively because it corresponds to the start of cormorant population increases on East Sand Island as opposed to any sort of modelling or analysis demonstrating that this actually represents a scientifically valid or stable minimum population target.

The Corps predicates its support for Alternative C on an assumption that cormorant populations outside of the Columbia Estuary are relatively stable. It concludes that the major factors that led to cormorant declines over the past century -- including persecution by humans, egg collecting, colony disturbance and environmental contaminants (Primarily DDT) -- have been resolved, that current laws are sufficient to protect cormorant populations, and that FWS will issue no more than 936 additional lethal take permits on an annual basis going forward. However, these assumptions by the Corps are inaccurate for several reasons:

- Cormorant populations in the Western United States remain at least an order of magnitude smaller than historic populations. There is simply no credible case to be made that cormorant populations have fully recovered from historic threats. The Pacific Flyway Council writes the following in its report: *A Framework for the Management of Double-crested Cormorants Depredation on Fish Resources*:

*DCCO (Double-crested Cormorants) were reduced in numbers and range during the 19th and early 20th centuries due to human encroachment and persecution, and widespread use of chlorinated hydrocarbons (e.g., DDT and its metabolites). Since the 1960s, DCCO numbers have increased with better environmental regulations and protection under the Migratory Bird Treaty Act....Population growth within the Pacific Flyway is largely attributed to the population increase of the East Sand Island colony in the Columbia River estuary, now the largest DCCO colony in the world. However, declines of DCCO colonies have been documented over much of southern Alaska, British Columbia, Washington, and southern California. Overall DCCO abundance in the Pacific Flyway is much smaller than it was*

Audubon Society of Portland  
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Portland, OR 97210  
(503) 292-6855  
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*historically....DCCO population on the Pacific Flyway is at least an order of magnitude smaller than it was historically.” (Framework at pp 1 and 8)*

- Outside of East Sand Island, populations continue to decline in most areas of the Pacific Northwest. Specifically, populations are declining in British Columbia, Coastal Washington, and Coastal Northern California. In British Columbia, cormorants are a “blue-list species” (species of special concern) due to their declining populations. Long-term trends for interior populations in Oregon and Washington, which make up a relatively small percent of the western population, are unclear, but there is no indication that they have increased significantly. Two of the largest interior colonies in Oregon at Malheur National Wildlife Refuge and Upper Klamath Lake have declined significantly in recent years, and Malheur may be producing no cormorants at all (DEIS at 3-24).
- The Oregon Coast represents the one location outside the Columbia River Estuary that the Corps can identify with some certainty as supporting a stable cormorant population in recent years. However, the Oregon Coast population outside the Columbia River Estuary represents a total of 2,463 breeding pairs, less than 8% of the total western population. It is also under relentless pressure from the Oregon Department of Fish and Wildlife, which is currently hazing cormorants at six locations along the Oregon Coast including the Nehalem, Nestucca, Coquille River, Tillamook Bay, Alsea Bay and Astoria<sup>3</sup>. ODFW has also received permits to take up to 50 cormorants each for research purposes at Tillamook Bay and at the mouths of the Umpqua and Rogue Rivers, and has applied for depredation permits kill cormorants at three coastal estuaries<sup>3</sup>. ODFW has even developed a partnership with Emory-Riddle Aeronautical University to develop a drone “capable of flying to cormorant colonies on offshore rocks to take photographs....but applications could be made such as hazing of foraging cormorants.”<sup>4</sup>
- Other large colonies outside the “affected environment” analyzed in the DEIS are also experiencing significant cormorant declines, most notably at Mullet Island in the Salton Sea. We question the decision to restrict the affected environment to not include the entire western population of cormorants given data demonstrating that East Sand Island may be drawing emigrants from throughout the western populations.<sup>5</sup> A significant decline in cormorant populations triggered by the proposed actions at East Sand Island could have regulatory and economic implications across the entire Western United States, especially if cormorant populations require additional protections to recover populations.
- Adkins et al list a variety of existing threats to cormorant population in the Western United States including predation, human disturbance, environmental contaminants, oil pollution, development impacts, disease and decline of the bird’s forage base. (Adkins and Roby at 31-32) The DEIS fails to adequately address any of these threats in the Pacific Northwest. Given the magnitude of the proposed population reduction and the permanent limitations that will be implemented of cormorant habitat at the only colony that is currently adding substantively to cormorant populations in the Western United States, all of these threats require careful consideration. To the degree that threats may pose a significant risk to cormorant populations

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<sup>3</sup> <http://www.dfw.state.or.us/news/2014/march/032414.asp>

<sup>4</sup> Testimony of Ron Anglin before the Oregon Legislature  
<https://olis.leg.state.or.us/liz/2013R1/Downloads/CommitteeMeetingDocument/26137>

<sup>5</sup> Adkins et al.

across the Western United States, cormorants' precarious status across this area would favor a dispersal-based management strategy as described in Alternative B rather than a lethal control-based strategy as described in the preferred Alternative C. In particular we urge the Corps to focus extra attention on the following:

- Bald Eagle predation and harassment: Increases in coastal bald eagle populations are putting unprecedented pressure on a variety of colonial nesting birds along the coasts of Oregon and Washington, including at East Sand Island. This has implications for cormorant colonies along the entire coastline, but the Corps should focus on whether reducing the size of the East Sand Island population increases the vulnerability of the remaining population to predation by bald eagles and other species such as gulls and crows that may take advantage of flushing caused by bald eagles.
- Disease: Newcastle Disease may have played a significant role in the collapse of the large colony at Mullet Island in the Salton Sea and has now been identified within the population at East Sand Island. The Corps should assess the potential for significant disease outbreaks to drive cormorant population levels below targets identified in the DEIS.
- Forage Fish Populations: How might changes in ocean conditions associated with climate change affect cormorant populations over the next several decades?
- Human Disturbance: The animosity aimed at cormorants has reached a remarkably high pitch. The Corps has itself suggested at meetings with environmental stakeholders, including Audubon, that failure to act to curtail fish predation due to birds on East Sand Island could result in deliberate unauthorized efforts to release predatory species onto the island or other illegal activity intended to reduce bird populations. Roby et al. (2010) in the *Status Assessment 1999-2009* note several instances where cormorant colonies have been impacted by human disturbance and write, "with expanding human populations along the coast and the increasing perception that cormorants represent a threat to sport and commercial fisheries throughout the range of the Western Population, human disturbance could pose a significant threat to this population in the future, especially in the absence of new rules and restrictions. Nesting colonies on artificial habitats (e.g., bridges, dredge spoil islands, navigational markers, power towers) used by humans or accessed for maintenance may be particularly vulnerable." (Status Assessment at 28). The EIS should provide a clear assessment of the vulnerability of significant cormorant colonies in the Pacific Northwest and the implication of the potential loss of these colonies for cormorant populations in the coming decades.
- Hazing and Harassment: The DEIS fails to assess the implications of increased hazing and harassment of cormorant populations in the Western United States. Hazing and harassment of cormorants prior to the onset of nesting is legal and requires no permit from the U.S. Fish and Wildlife Service. It is possible that legal and undocumented harassment is already causing population reduction and abandonment at existing colonies. ODFW is partnering with and training non-profit organizations and sport fishing groups [to harass cormorants in order to

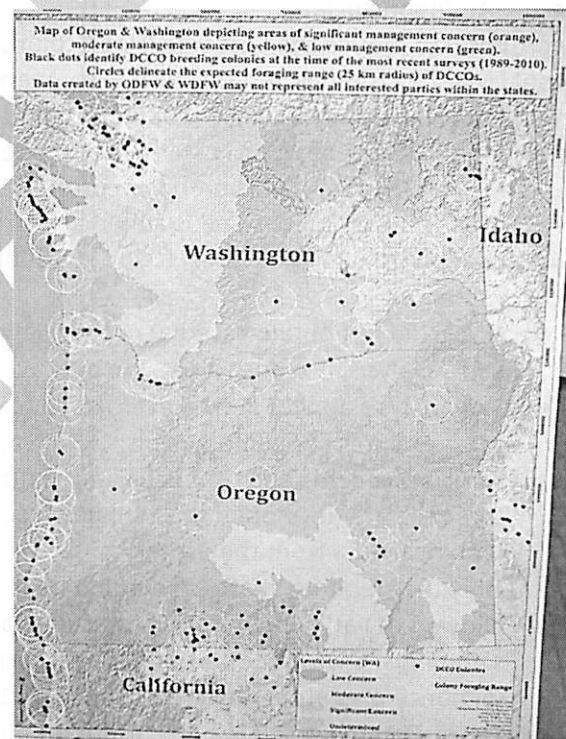
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5151 NW Cornell Road  
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amplify the agency's existing ability to conduct harassment activities, and is exploring the potential to use drones to augment its harassment capabilities on more remote coastal islands.<sup>6</sup>

- There is significant potential that in order to achieve target cormorant populations in East Sand Island, the Corps will have to kill far more birds than the 16,000 specified in the DEIS. Emigration is identified as one of the causes of cormorant population increases on East Sand Island. It is possible, even likely, that as hazing and control activities increase elsewhere in the Pacific Northwest, cormorants will continue to immigrate to East Sand Island and thus continually replenish the population. It is also entirely possible that, as with Caspian Terns, cormorants will prove to be adaptable to more dense nesting concentrations than has been previously documented. The Corps could be faced with a situation in which cormorants continue to immigrate to East Sand Island from declining populations elsewhere, only to be subject to lethal control upon arrival. East Sand Island could therefore turn into the proverbial sinkhole for cormorant populations in the Western United States.

**2. The Corps and other partnering federal and state agencies have failed to set minimum population thresholds for Double-crested Cormorants or identify nesting sites in either Oregon or Washington where existing or new Double-Crested Cormorant nesting colonies would be welcome.**

In their comments on prior cormorant EAs and the public scoping process for the current DEIS associated with East Sand Island, conservation groups, including Portland Audubon, have repeatedly urged the Corps and partnering state and federal agencies to develop a credible cormorant management plan that a) identifies minimum population thresholds; b) describes how those populations will be distributed; and c) establishes sites where cormorant colonies would be welcome and likely to persist over time. These steps are crucial, and would go a long way toward lending credibility to lethal or non-lethal cormorant reduction efforts on East Sand Island, especially given that population increases on East Sand Island are at least partially the result of emigration of cormorants from colonies that have declined or disappeared elsewhere. The DEIS completely fails to address these concerns and instead relies on an unsupported assumption that cormorant populations outside of the Columbia Estuary will remain stable (see issue #1 above).



**Map of DCCO Management Concern Areas  
(From the DCCO DEIS, Figure 3-14)**

The degree to which cormorants have become unwelcome throughout the Pacific Northwest is exemplified by a map included in the DEIS (Figure 3-14) and displayed at an open house informational

<sup>6</sup> <https://olis.leg.state.or.us/liz/2013R1/Downloads/CommitteeMeetingDocument/26137>



meeting on the DEIS hosted by the Corps in Portland on July 10, 2014. The map used data produced by ODFW and WDFW to identify areas of high, moderate, and low management concern regarding cormorant breeding colonies. The Map of Oregon depicts virtually the entire State of Oregon, including the entire coastline, as an area of high concern regarding cormorants. The remaining portion of the state is ranked as being of moderate concern. All but two of the colonies in the State of Oregon are located in areas of high concern. Washington fairs slightly better, but still with the entire coastline south of Aberdeen ranked as being of high management concern.

**3. The science describing Double-crested Cormorant predation on listed salmonid species and the benefits that would be derived by implementing Double-crested Cormorant population control actions is weak and lacks peer review**

The decision to kill 16,000 native birds and 25% of the western population of a species is an extraordinary decision, and the public should be able to have confidence that the science supporting such a decision is strong and was held the highest level of rigor. To the contrary, much of the science supporting this DEIS is remarkably weak and speculative and has not been scrutinized through the peer review process.

The following analysis provided by Stanley Senner of the National Audubon Society and Joe Liebezeit of Portland Audubon Society:

The proposal to reduce the East Side Island colony of cormorants to 5,600 pairs rests entirely on a National Marine Fisheries Service (NMFS) comparison of smolt survival and consumption by cormorants between arbitrarily defined base (1983-2002) and current (2003-2009) periods. This analysis resulted in a finding that survival of juvenile steelhead, the salmonid species most susceptible to cormorant predation, was 3.6 percent lower in the current versus base period. The proposal to reduce cormorants to 5,600 pairs on East Sand Island is aimed at erasing this "survival gap." We have the following concerns about this analysis, which is critical to the selection of appropriate and effective management strategies:

- NMFS did not obtain external peer review (G. Fredricks, NMFS, pers. comm.) on the "survival gap" analysis, nor does it use the best available science.
- The analysis applies a fixed average per capita cormorant predation rate on "annual estimated estuary smolt population levels," which are preseason forecasts of the numbers of smolts that survive the dams and other challenges during out-migration to reach the estuary. These forecasts are developed with unknown accuracy and precision and are not confirmed with empirical data from the estuary.
- Only the smolt estimates and numbers of cormorants nesting in the Columbia River estuary are allowed to vary, ignoring high inter-annual variability in cormorant predation rates on juvenile salmonids. Environmental conditions, such as the volume of freshwater discharge, strongly influence predation rates (Lyons et al. 2014), yet these influences were not taken into account.
- There are no actual data on cormorant diets or predation rates on salmonid smolts before 1999, and data on numbers of cormorants in the Columbia estuary during the base period are limited. The lack of cormorant data from the base period makes it difficult, if not impossible, to characterize either the cormorant population or smolt predation rates with any confidence.
- The NMFS analysis does not use data from salmonid smolt PIT tags recovered on the East Sand Island cormorant colony; these data would have allowed far more accurate stock-specific

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assessments of predation rates and would have supported an analysis of benefits of different management alternatives on the recovery of particular ESA-listed ESUs/DPSs of salmonids.

- Compensatory mortality was ignored in the analysis because it was assumed that compensatory mortality rates were stable during both the base period (1982-2001) and current period (2002-2009). It is surprising that this assumption was made given the dynamically changing Columbia Estuarine system and the fact that the dataset spans nearly a 30 year period. When a 50% compensatory mortality is assumed, the annual estimated avian take of salmonids is further reduced (1.6% loss of steelhead smolt, 0.6% loss of Chinook) (Lyons et al. 2014), further casting doubt on population level impacts to salmonids due to cormorant predation.
- The DEIS fails to provide meaningful analysis of what percentage of cormorant take is comprised of non-listed hatchery fish. This is important because studies have shown that hatchery fish are more vulnerable to predation.
- The DEIS fails to meaningfully address the fact that injured or otherwise unhealthy fish are more susceptible to predation (DEIS at 4-93). A significant percentage of the listed fish being consumed at East Sand Island may have been made vulnerable by their passage through dam turbines and their loss attributable as much to dam operation as to bird predation.
- The Corps has refused public requests to release the raw data that went into the bioenergetics modeling. Without this data, it is impossible for reviewers assess the validity of the bioenergetics models.
- Finally it is important to note that overall populations of listed salmon have increased in the current period as compared to the base period despite the apparent increase in avian predation. This shows that avian predation is not an important source of overall salmon mortality. Rather, improvements in dam configuration and operation, together with efforts to restore salmon habitat, have allowed salmon to begin to recover despite any increases in the cormorant population. This suggests that the focus should remain on dam operations and habitat restoration as opposed to lethal control of native predators.

The ultimate goal of the EIS and underlying NOAA BiOp is to protect listed salmonid runs from continued declines due to cormorant predation. Yet, the BiOp analysis in the EIS<sup>7</sup> does not substantiate that the estimated 3.6% annual loss of steelhead smolt and 1.1% annual loss of Chinook (attributed to cormorant predation) will have a significant impact on population growth trajectories.

The bottom line is that the projected “survival gap” has a serious credibility gap. The analysis is inadequate as a basis for a decision to reduce the East Sand Island cormorant colony by more than half and the western North American population by at least 25 percent. In fact, it is entirely possible that with a more scientifically sophisticated and reliable analytical approach, there may be no survival gap.

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<sup>7</sup> Double-crested Cormorant Estuary Smolt Consumption BiOp Analysis / gap analysis – Appendix D in the EIS  
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#### 4. The DEIS fails to adequately address the issue of non-target take of protected species and individuals:

Above and beyond the massive scale of intended take under Alternative C, there is also significant potential for take of non-target species as well as non-target cormorants above the threshold set in the DEIS. We believe that the DEIS underestimates the threat to both Pelagic and Brandt's Cormorants, both of which are found in the vicinity of East Sand Island and are easy to mistake for Double-crested Cormorants. Given that many of these birds will be shot over water and difficult to retrieve, we question how the Corps and FWS will accurately account for the non-target take of these species.

We are also concerned that lethal take of nesting birds within the East Sand Island colony could result in far greater impacts on Double-crested Cormorants than is allowed under the terms of the DEIS. For all its length, the DEIS does a surprisingly poor job of describing and analyzing how take will occur within the colony. These details should be clearly described and circumscribed in the DEIS to allow for meaningful evaluation. We question whether it is truly feasible to kill birds on their active nests using rifles within a densely occupied colony without causing some level of flushing, abandonment, and opportunistic nest predation of non-target birds, as well as question how the Corps and U.S. Fish and Wildlife Service would monitor and quantify these impacts, especially if this work is done at night. There is significant potential for non-target take of cormorants that will go undocumented.

The Corps also fails to adequately assess the potential non-target impacts on Streaked Horned Larks (*Eremophila alpestris strigata*). Streaked Horned Larks were listed as threatened under the Endangered Species Act in 2013. Justification for not listing them as Endangered relied largely upon the current status of the remaining populations found in Oregon. Along the Columbia River, Streaked Horned Larks nest primarily on dredge spoil islands. Today fewer than 100 breeding adults are found in the Columbia River Estuary. Streaked Horned Larks have been observed on East Sand Island but no nesting has been documented. There has been documented nesting on Rice Island and Miller Sands Spit. (EIS at 3-33) At this point in time, no recovery plan has been produced for Streaked Horned Larks. In addition, neither the U.S. Fish and Wildlife Service, nor the Corps can point to any Neither the U.S. Fish and Wildlife Service, can point to any substantive document describing how the Corps will manage dredge spoil islands to protect and enhance Streaked Horned Lark populations.

The Corps' treatment of Streaked Horned Larks in the EIS is cursory at best. Unfortunately, this is consistent with past EAs associated with East Sand Island written by the Corps.<sup>8</sup> The Corps writes "Potential (under alternative B) for cormorant dispersal to and the need for cormorant hazing at islands

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<sup>8</sup> Audubon comments on a 2013 EA to conduct lethal control of Glaucous Winged/Western Gulls on East Sand Island and a 2012 EA to restrict Caspian Tern nesting habitat on East Sand Island both highlighted the Corps failure to address potential impacts of associated hazing activity on Rice Island, Miller Sand Spit, and other island in the Columbia River Estuary. The 2012 EA was withdrawn and the 2013 EA resulted in the adoption of the No Action Alternative.

designated as an important streaked horned lark nesting area would be high. For example, Rice Island is an important streaked horned lark nesting area and former cormorant nesting colony in the Columbia River Estuary." (EIS at 4-29). The Corps notes that under phase 2 of Alternative C, dispersal to and hazing on these important Streaked Horned Lark breeding islands could also occur, but the Corps makes the assumption that because cormorant numbers would be lower, hazing activities would also be lower on these islands. There is no logical basis for this assumption. The incremental increase in hazing will be dictated by a variety of factors, including the locations where the cormorants attempt to nest and the timing and persistence in their nesting attempts as well as the number of birds involved. The Corps provides no explanation as to why the hazing activities associated with removing 100 cormorants from a Streaked Horned Lark nesting island would cause any less disturbance than the hazing activities associated with removing 500 or 1000 cormorants. The preferred hazing strategies including use of dogs and ATVs could cause nest failure or abandonment for Streaked Horn Larks regardless of the number of cormorants involved. The Corps seems to justify Alternative C on the basis that it may not be as bad for Streaked Horned Larks as Alternative B, but there is no evidence that in fact it would be any less adverse and moreover the basis for evaluation should not be a comparison with some other hypothetical approach, but rather a modeling of its likely actual impacts.

Until the Corps and USFWS conduct a section 7 consultation and devise a science-based and legally binding management plan for Streaked Horned Lark on Columbia Estuary dredge spoil islands, the Endangered Species Act protections afforded to Streaked Horned Larks could preclude implementation of all of the action alternatives described in the DEIS and this issue is going to remain a major obstacle of piscivorous bird management in the estuary. Current Corps hazing activities on important Streaked Horned Lark nesting islands and in designated critical habitat appear to be done with little consideration or understanding on the impacts on Streaked Horned Larks -- yet the Corps returns year in and year out with new proposals that would potentially expand these hazing activities. There is little reason to have confidence in USFWS' ability to protect and recover this species if, in addition to a very permissive 4(d) rule, it continues to approve activities that adversely affect the species throughout its remaining range.

We recommend the following with regards to Streaked Horned Lark:

- a) USFWS and the Corps need to conduct systematic surveys of Streaked Horned Larks to identify all nesting locations on Columbia River dredge spoil islands managed by the Corps, including East Sand Island.
- b) USFWS and the Corps need to develop a science based, legally binding management plan for Streaked Horned Larks on Columbia River dredge spoil islands managed by the Corps that includes specific protected areas (potentially on a rotational basis) and local population targets.

**5. The Corp fails to adequately explore non-lethal strategies to reduce salmonid predation in the Columbia River Estuary and inaccurately asserts that it has determined that non-lethal strategies would not be effective at reducing fish predation in the Columbia River Estuary:**

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